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## COST OF WATER MAIN CONSTRUCTION IN MASON CITY, IOWA<sup>1</sup>

By W. A. JUDD

In 1915 and 1916, labor was plentiful with the Mason City Water Company at  $22\frac{1}{2}$  cents per hour. In 1917 and 1918 it was scarce at any price and part of the time the company had only its emergency crew of five men to work with. Consequently a fair comparison of the costs during the two periods can scarcely be made. So many things influence the cost of construction that each job must be considered by itself. For instance, in 1915, a half-mile stretch of 10-inch pipe was laid in good clay digging, with some shale. The weather was hot and the laborers, except the pipe gang, were not working up to usual efficiency. The earth excavation costs ran up to 37 cents per cubic yard, loose rock 88 cents, back filling 11 cents, and the 10-inch pipe only cost 5 cents per foot to lay. Part of this low laying cost is due to the fact that the ditch stood up well, and 500 or 600 feet would be laid in one day. Contrast this laying cost with another job the same year, which was scattered in little bits for half a mile, laying intersections preparatory to paving. The laying cost here for 6-inch pipe was 7 cents per foot, but excavation prices were lower than on the longer job, no doubt due to the cooler weather which prevailed. In 1916, one block of 10-inch pipe laid in a rock ditch a little at a time cost 16 cents per foot with labor at  $22\frac{1}{2}$  cents per hour. On this job, the cost of back filling jumped to  $22\frac{1}{2}$  cents due to the rock present. On another very similar job in 1915 a large amount of rock made the cost of back filling run up to  $24\frac{1}{2}$  cents per cubic yard.

In 1915, a string of 8-inch pipe was laid in sandy clay during hot weather. Earth excavation cost 32 cents per cubic yard; back filling 13 cents per cubic yard, and laying 3.7 cents per foot. A similar job in 1916, when a new pipe gang was broken in, showed earth costs 40 cents, back filling 16 cents and pipe laying 7.7 cents. During

<sup>1</sup>Read before the Iowa Section, April 16, 1919.

very hot weather, that year, a string of 8-inch pipe was laid following a trenching machine at a cost of 7.1 cents per foot. The same pipe gang followed the same machine with a string of 10-inch pipe for 7.8 cents per foot, and another string of 10-inch pipe, in caving clay and under rather difficult circumstances, for 8.9 cents per foot.

The influence of weather and soil conditions is shown very well in some 6-inch jobs following this machine. One job in wet, sticky clay cost 8.9 cents per foot. Bracing was needed here right behind the machine. Another job in wet clay but with weather conditions more favorable cost 6.4 cents per foot, while in a good clay ditch with favorable weather the cost ran 4.0 cents and with the best weather of all, 6-inch pipe laid in a sandy ditch only cost 3.2 cents per foot. In 1917, with a small gang at 30 cents per hour, earth excavation cost close to 42 and 47 cents on two representative jobs. A little rock in one caused back filling to cost 16 cents, while the other cost  $12\frac{1}{2}$  cents. Pipe laying on these jobs ran about 7 cents per foot, which was approximately the cost also of laying pipe in a rock ditch dug by contract.

In 1918, cost keeping did not amount to much, so far as any comparative value of the records is concerned. Earth costs varied from 42 to 66 cents and rock excavation in small quantities went as high as \$5.50 per cubic yard. The cost of pipe laying was very consistent, however, being nearly  $8\frac{1}{2}$  cents per foot for 6-inch pipe on all jobs. The old, dependable emergency gang was responsible for keeping the pipe laying price so reasonable. Perhaps more stable labor conditions will make cost keeping a profitable investment this year; it certainly did not amount to anything last year. During the previous years, however, similar conditions produced similar results and labor costs could be predicted with reasonable accuracy.